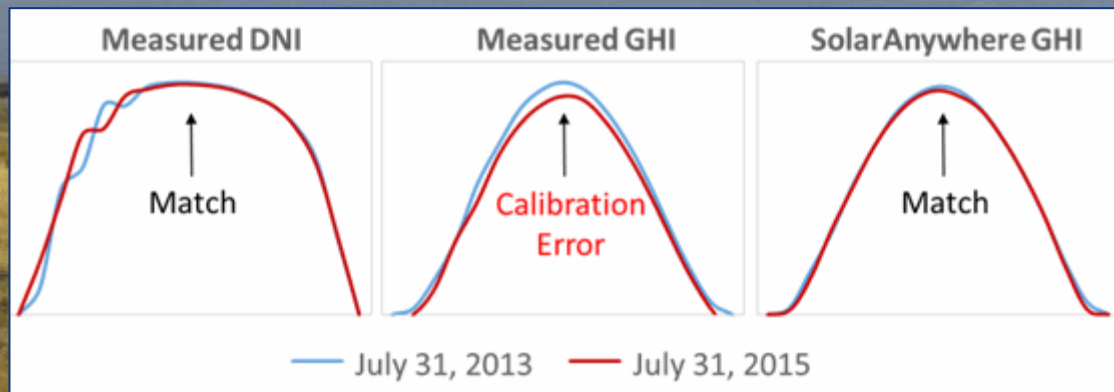


# Ground **Satellite** Measurements for Satellite Ground True-up

Satellite data detected calibration error in GHI measurement.

Fort Peck, Montana SURFRAD station.

**Research Need:** how to best combine advantages of satellite and ground measurements.





# GOES-R Satellite Forecast Improvements

	GOES-West	GOES-R
Status	Operational, used in current California Forecasts	Launched Nov. 19, 2016, operational late 2017; East vs. West final location TBD
Temporal Resolution	30 minutes	5 minutes  Improved Real Time Market forecasts
Spatial Resolution	1 km x 1 km (approx.)	½ km x ½ km  4X current GOES-West, improved small cloud and cloud edge detection
Other		<ul style="list-style-type: none"><li>• Improved navigation, directional stability (more accurate cloud placement)</li><li>• More spectral channels (improved cloud phase retrievals)</li><li>• Improved Aerosol Optical Depth (AOD) (greater local accuracy)</li></ul>

**Research Need:** Incorporate methods to take advantage of GOES-R (and GOES-S...) capabilities



# Probabilistic PV Power Forecasting

- Provides CAISO with input for scheduling balancing energy
- **Research Needs:**
  - Incorporate methods to quantify uncertainty
    - Affects both BTM generation (net load forecasts) and utility-scale resource forecasts
  - Develop methods for “risk-adjusted” forecast
    - May be better adjust forecast downward

If forecast is...	... too HIGH	... too LOW
In the real time market, CAISO needs to...	... procure <u>more</u> energy	... procure <u>less</u> energy
	More expensive	Less expensive